

**Water for All
Conserve, Value, Enjoy**



DESALINATION AND ULU PANDAN NEWATER DBOO PROJECTS – PUB'S EXPERIENCE

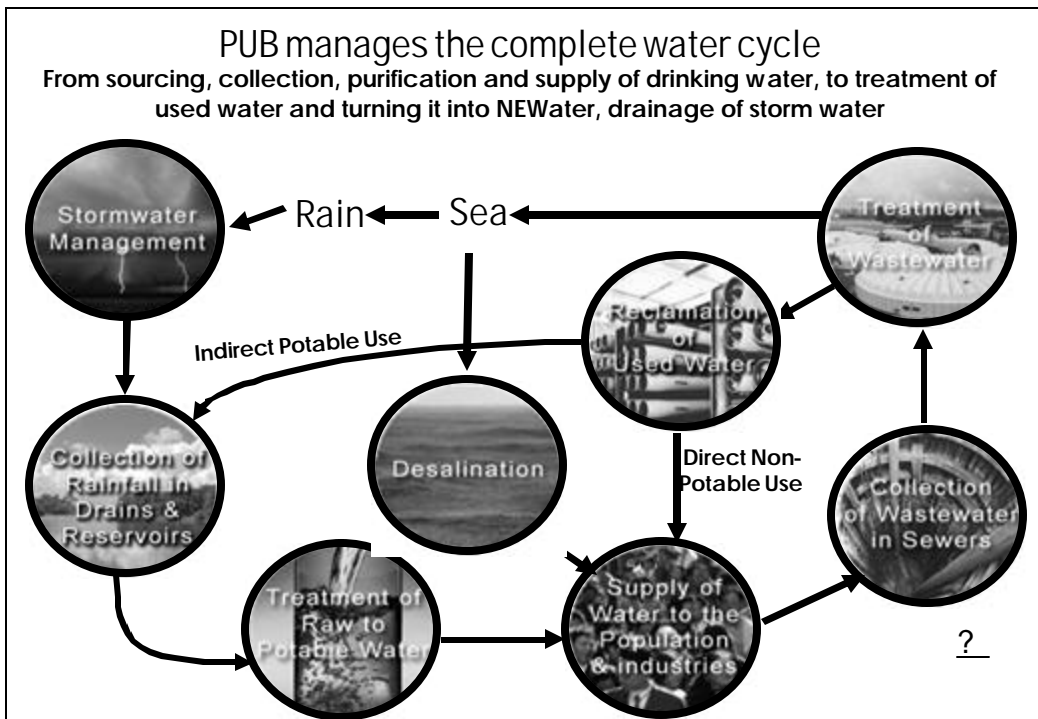
Presented by Sivaraman Arasu
Capacity Building Workshop, Bangkok, 25-27 July 2006

OUTLINE OF PRESENTATION

- ✓ **About PUB**
- ✓ **Overview of Desalination and Ulu Pandan NEWater Design- Build-Own-Operate (DBOO) Projects**
- ✓ **Why DBOO for Desalination and Ulu Pandan NEWater Projects**
- ✓ **Key Features of the DBOO Projects**
- ✓ **DBOO Project Structure**
- ✓ **Payment Structure and Indexation**
- ✓ **Performance Monitoring**
- ✓ **Concluding Remarks**

About PUB

- ✓ PUB is the national water agency and a statutory board under Singapore's Ministry for the Environment and Water Resources.
- ✓ PUB manages the country's water supply, water catchments and sewerage in an integrated way.
- ✓ PUB is responsible for managing the whole water cycle, from sourcing to the collection, purification and supply of drinking water, to the treatment of used water and its reclamation into NEWater, as well as the drainage of stormwater. ?



Overview of DBOO Desalination Project

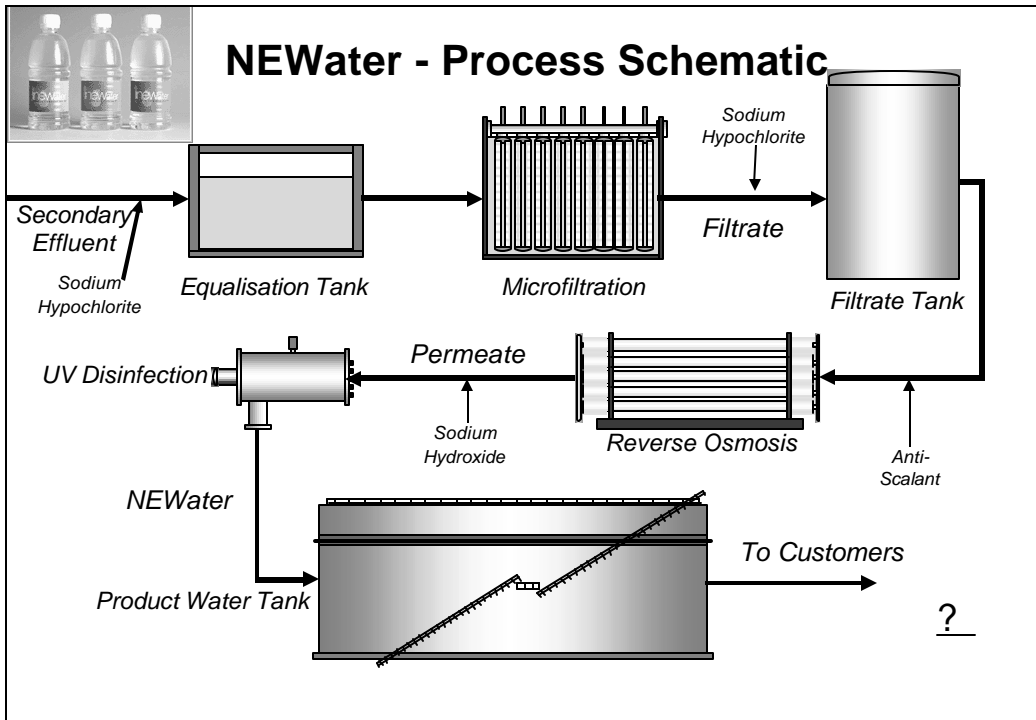
- **Date of Agreement** : April 2003
- **Concession Company** : SingSpring (Pte) Ltd
- **Contract Term** : 2005 – 2025
- **Plant Capacity** : 30 mgd (136,000 m³/day)
- **Opened on 13 Sep 05**



Overview of Ulu Pandan DBOO NEWater Project

- **Date of Agreement** : Jan 2005
- **Concession Company** : Keppel Seghers NEWater Development Co Pte Ltd
- **Contract Term** : 20 yrs (2007 – 2027)
- **Capacity of Plant** : 32mgd (148,000m³/d)
- **Supply commencement** : 1 Qtr 2007
- **Location** : Within existing Ulu Pandan Water Reclamation Plant
- **Feedwater Source** : Secondary treated effluent from Ulu Pandan WRP

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Why PUB adopted the DBOO Scheme for Desalination?

- **Desalination - various desalination technologies available but energy intensive**
- **High capital and operating costs – need to optimize life cycle costs**
- **Under PUB's DBOO approach**
 - **private sector selects and optimizes the configuration of technologies**
 - **offers to PUB a competitive price for supply of desalinated water**

Why PUB adopted the DBOO Scheme for Ulu Pandan NEWater Project

- **PUB presently owns and operate three NEWater plants with a total capacity of 20 mgd**
- **With the experience gained from these plants PUB has established the viability of reclamation of used water.**
- **For the Ulu Pandan NEWater project, PUB decided to invite the private sector participation to allow greater private sector involvement in the production of NEWater. At the same time, the DBOO could result in enhanced efficiency and keep costs affordable.**

Key Features of PUB's DBOO Projects

- 1) **PUB purchases desalinated water/NEWater, instead of a desalination/NEWater plant.**
- 2) **Long term**
 - **20 years supply contract**
- 3) **Private sector financed**
 - **Equity and debt financing from the private sector**

Key Features of PUB's DBOO Projects (Continuation)

4) Clear and measurable outcomes are specified for quantity and quality of water

a) Quantity

- **30 million gallons per day of desalination capacity and supply of desalinated water of up to 30 million gallons per day upon request**
- **32 million gallons per day of NEWater capacity and supply of NEWater of up to 32 million gallons per day upon request**

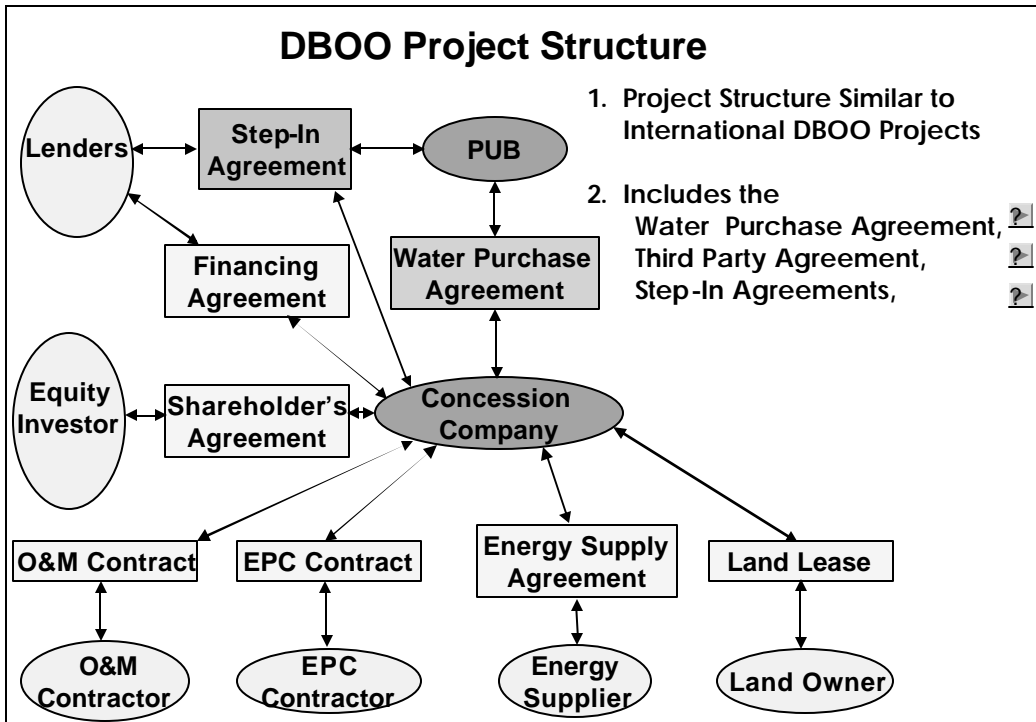
b) Quality

- **The quality of desalinated water/NEWater must meet the specified requirements**

Key Features of PUB's DBOO Projects (Continuation)

c) Technical Specifications

- **The technical specifications of the DBOO projects are performance-based.**
- **Allows for the Concession Company to produce innovative, cost-effective solutions.**



Water Purchase Agreement

- The Water Purchase Agreement (WPA) is the key agreement for the DBOO Scheme
- It contains the technical, commercial and legal terms and conditions for the supply and purchase of desalinated water.



Third Party Agreements

- **Third party agreements are entered into by the Concession Company for the provision of various facilities.**
- **PUB is not a party to third party agreements.**

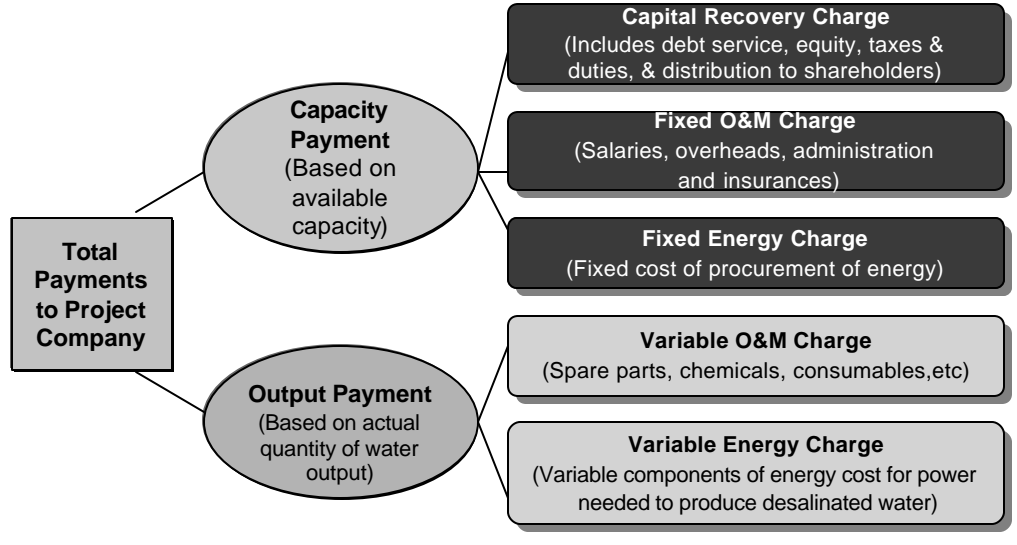


Step-In-Agreement

- **Tripartite Agreement amongst PUB, Concession Company and the Lenders**
- **Provides for the Lenders to step-in and rectify project company's defaults under certain conditions defined in the Water Purchase Agreement**
- **For NEWater DBOO, provides for PUB to step-in to ensure service continuity**

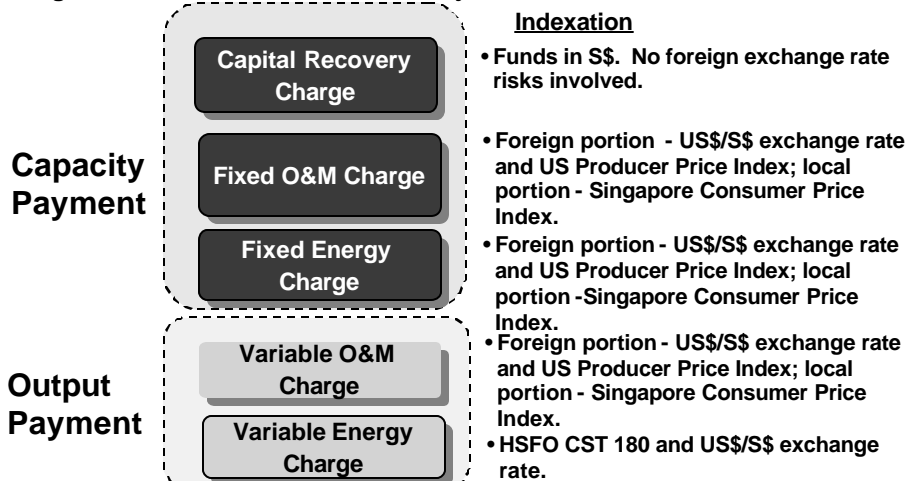
Payment Structure and Indexation

Payment structure based on capacity payments and output payments.



Payment Structure and Indexation

Concession Company has offered base rates for the various capacity and output payment components at tender submission. To share the long term risks of future changes in costs, the base rates are subject to indexation.



Note: Foreign Portion involved only for DBOO Desalination

Payment Structure and Indexation (Continuation)

- **The payment structure is formula based and is generally applicable. Being formula based minimizes administrative efforts**
- **Some special cases, eg costs resulting from changes in law not covered by the formulas. Provisions in the water purchase agreements provide for case by case adjustments for such cases.**

Performance Monitoring

- **Includes provisions for day-to-day monitoring of performance and evaluating the remedial action taken by the Concession Company when performance standards are not met.**
- **Comprehensive monitoring and audit system in place.**
 - **On-line continuous monitoring of key water quality parameters.**
 - **Regular analysis of a comprehensive range of water quality parameters by an accredited laboratory.**
 - **Regular audit by PUB's internal and external audit committee**

Concluding Remarks

Specialist Expertise

- **DBOO projects are generally more complex than usual procurement projects.**
- **DBOO projects specialist financial, legal, contractual, negotiation and management skills which are not readily available in the public sector.**
- **In our case, the two DBOO projects have so far gone well because the contract was balanced. A rigorous selection process was adopted to ensure that selected DBOO partners had the capacity to take on the projects.**

Concluding Remarks (Continuation)

Managing the Public Private Partnership (PPP)

- **For both DBOO projects, PUB has taken a proactive and close partnership approach to reach a win-win implementation of the projects.**
- **The partnership approach is championed at the top level in both PUB and the private PPP providers. Such close working relations have so far ensured smooth delivery of the PPP projects.**

Thank You